

# JAPAN

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JIS S 0013 (2011) (English): Guidelines for older persons and persons with disabilities -- Auditory signals for consumer products

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*The citizens of a nation must  
honor the laws of the land.*

Fukuzawa Yukichi

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JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

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JIS S 0013 : 2011

**Guidelines for older persons and  
persons with disabilities—Auditory  
signals for consumer products**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

Consequently **JIS S 0013** : 2002 is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

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## **Guidelines for older persons and persons with disabilities—Auditory signals for consumer products**

### **Introduction**

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 24500** published in 2010 without modifying its technical contents for the corresponding parts, but with addition of one **JIS** original specification (as for “invalid input signal”) which is not given in the corresponding International Standard.

The portion underlined with dots is the matter not included in the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

People are surrounded by various consumer products: home electrical appliances, information and communication products, office automation equipment, gas-heating equipment, toys, sanitary equipment, health-care products, cameras, etc. Auditory signals of such products must be designed so that the user can easily hear the signals in various circumstances where the product is normally used, and understand the objective and meaning of signaling.

This Standard has been developed for improving the usability and accessibility of auditory signals used in such consumer products, thereby improving the products themselves when they are used by all people, including those with visual impairments and older people with age-related hearing impairments. Older people include those aged 65 and above for whom age-related changes of hearing become obvious.

The auditory-signal patterns specified in this Standard have been selected based on results of experiments in which people of different age ranges and with different levels of visual impairment participated. Regarding the signals, it has been confirmed that the purpose of signaling is easy for listeners to understand and that the signals are not easily confused with signals in other signal categories.

This Standard adopts the principles of accessible design presented in **JIS Z 8071** and amplified in **ISO/TR 22411**.

### **1 Scope**

This Standard specifies the auditory signals used as a means of feedback for operations or conditions of consumer products when used by a person with or without visual or auditory impairment. It is intended to be applied as appropriate to such products depending on the product type and its conditions of use.

It is applicable to auditory signals of a fixed frequency used in general applications (also called “beep sound”), but not to variable frequency or melodic sounds.

It does not specify fire or gas leak alarm sounds or crime prevention alarm sounds (determined by other laws and regulation), electronic chimes, voice guides or other sounds particular to communication instruments such as telephones; nor is it applicable to auditory danger signals for public or work areas (covered in **ISO 7731**, **ISO 8201** and **ISO 11429**).



It is not applicable to machines and equipment used for professional work; nor does it specify the sound pressure levels of auditory signals from the consumer products.

NOTE 1 For the determination of these levels, taking into consideration accessible design, see **JIS S 0014**.

NOTE 2 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

**ISO 24500** : 2010 *Ergonomics—Accessible design—Auditory signals for consumer products* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this Standard. The most recent edition of the standard (including amendments) indicated below shall be applied.

**JIS Z 8106** *International electrotechnical vocabulary Chapter 801: Acoustics and electroacoustics*

NOTE : Corresponding International Standard : **IEC 60050-801** *International Electrotechnical Vocabulary—Chapter 801 : Acoustics and electroacoustics* (IDT)

## 3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS Z 8106** and the following apply.

### 3.1 auditory signal

sound emitted from a product for the purpose of conveying information to help the user to use the product correctly

### 3.2 operation

action which the user performs, using a product for achieving a purpose

### 3.3 operation confirmation signal

sound acknowledging the response of a product immediately after a user's action to operate it

NOTE : Operation confirmation signals include reception and start signals, invalid input signals, stop signals and starting position signals.

#### 3.3.1 reception and start signal

auditory signal acknowledging receipt of a user's action to start or operate the product

#### 3.3.2 invalid input signal

auditory signal announcing that a user's action to operate the product can not be received

### **3.3.3 stop signal**

auditory signal acknowledging the user's action to stop the operation of the product

### **3.3.4 starting position signal**

auditory signal announcing the reference or starting position for the case in which the user makes a menu selection by repeatedly pushing a button

### **3.4 end signal**

sound announcing the completion of a product action

### **3.5 caution signal**

sound announcing the product cannot function independently in normal operation (or state)

NOTE 1 Caution signals differ in purpose from auditory emergency signals and auditory warning signals. The latter two signals are used to notify people of a serious dangerous situation in public and work areas (defined in **ISO 7731**).

NOTE 2 The caution signal is classified into weak and strong caution signals according to the degree of importance of the information.

#### **3.5.1 weak caution signal**

auditory signal which attracts the attention of the user to operation mistakes and requests the user's resetting of the product or assisting in the operation

Example An auditory signal of a washing machine announcing that the lid is open.

#### **3.5.2 strong caution signal**

auditory signal announcing the necessity of interrupting operation of the product and the user intervening to correct some abnormality before continuation of operation

Example An auditory signal of an electric oven announcing that it has stopped heating because of overheating.

### **3.6 ON time**

time during which the signal continues to sound

### **3.7 OFF time**

time without sounding a signal

### **3.8 ON/OFF pattern**

sequence of ON times and OFF times that constitute a signal

## **4 General aspects of auditory signals for products**

### **4.1 User control of volume level**

The user should be able to adjust the volume level of auditory signals based on hearing ability, distance from the product, effects of ambient environmental sounds, etc.

NOTE : **JIS S 0014** describes detailed methods for setting and adjusting the sound pressure level of auditory signals in noise.

## **4.2 Repetition of caution signals**

Caution signals shall be repeated only as long as the cause of signaling exists.

## **4.3 Fundamental frequency of auditory signals**

The fundamental frequency of auditory signals should not be higher than 2.5 kHz.

NOTE 1 The definition of “fundamental frequency” is given in **JIS Z 8106**.

NOTE 2 Many older users with age-related hearing loss have difficulty hearing high-frequency tones.

NOTE 3 Audibility of signals depends not only on their frequency, but also on their sound pressure level. **JIS S 0014** gives detailed methods for setting and adjusting the sound pressure level of auditory signals.

## **4.4 Options for signal frequencies**

Products should provide several options for signal frequencies so that users with hearing impairments can select an audible signal.

## **4.5 Use of complex sound signals**

Products should provide a complex sound signal (i.e. a signal with several harmonics, containing more than one frequency component).

NOTE 1 The definition of “complex sound” is given in **JIS Z 8106**.

NOTE 2 Complex sound signals are more likely to be heard than pure-tone-like signals by people with impaired hearing at some frequencies.

## **4.6 Turning off auditory signals**

Except for caution signals, the user should be provided with a means to turn off auditory signals.

# **5 Temporal patterns of auditory signals**

## **5.1 General**

Auditory signals are more abstract than spoken instructions. For this reason, temporal patterns of auditory signals should be designed so as

- to be understood without giving further instruction to the user, and
- not to be confused with other auditory signals used by the same product or those of another product used at the same time and place.

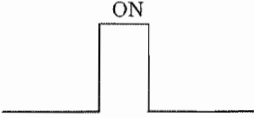
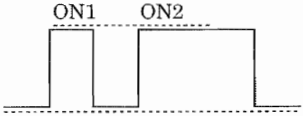
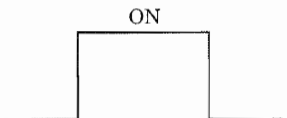
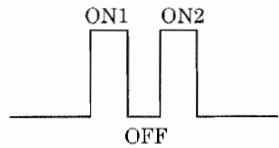
The temporal patterns of auditory signals presented in **5.2** to **5.4** shall be used for each signal category.

NOTE : A temporal pattern is a robust cue by means of which the user discriminates auditory signals from one another; it can therefore be used more effectively than other acoustic characteristics such as frequency or timbre.

## **5.2 Operation confirmation signals**

ON/OFF patterns in accordance with table 1 shall be used for operation confirmation signals.

**Table 1 ON/OFF patterns of operation confirmation signals**

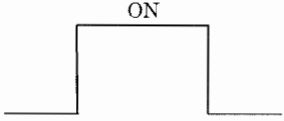
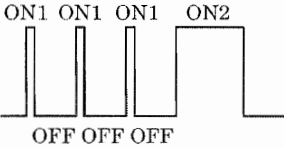
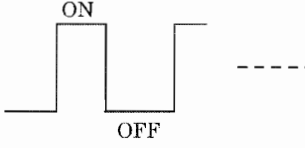
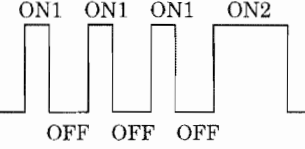
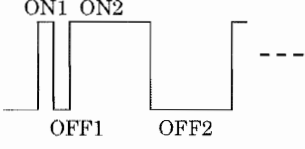
Signal category	ON time s	OFF time s	Repetition	Onomatopoeic description	Pattern
Reception and start signal	0.1 to 0.15	—	Single repetition	Pip	
Invalid input signal	ON1=0.1 ON2=0.5	0.1	Single repetition	Pip-peep	
Stop signal	0.5 to 0.6	—	Single repetition	Peep	
Starting position signal	0.05 to 0.075	0.05 to 0.075	Single repetition	Pip-pip (quick)	 <p>ON1 = ON2 ON1 ≥ OFF, ON2 ≥ OFF</p>

### 5.3 End signals

ON/OFF patterns in accordance with table 2 shall be used for end signals. Two or more signals may be used in a product if necessary.

The patterns are presented in an arbitrary order in table 2, and any signal may be chosen from a signal category, as appropriate.

**Table 2 ON/Off patters of end signals**

Signal category	ON time s	OFF time s	Repetition	Onomatopoeic description	Patterns
Case of hearing at a position where the product is within reach <sup>a)</sup>	0.5 to 1.0	—	Single repetition	Peep	
	ON1=0.1 ON2=0.8	0.5	Single repetition	Pi, pi, pi, peep (slowly)	
Case of hearing at a position distant from the product <sup>b)</sup>	0.3 to 0.8	0.5 to 1.0	Multiple repetition	Pip, pip, pip, pip...(specified times, slowly)	 <p>ON ≤ OFF</p> <p>The number of repetitions is discretionary, but numerous repetitions are usually beneficial for older users.</p>
	ON1=0.5 ON2=1.5	0.8	Single repetition	Pip, pip, pip, peep (slowly)	 <p>The number of times of ON1 shall be 3 or 4.</p>
	ON1=0.1 ON2=0.5	OFF1=0.1 OFF2=0.5	Multiple repetition	Pip-peep, pip peep, ... (specified times, slowly)	 <p>The number of repetitions is discretionary, but numerous repetitions are usually beneficial for older users.</p>
<p>Notes <sup>a)</sup> Examples include a signal of a tape recorder telling a nearby user that the tape has been rewound.</p> <p><sup>b)</sup> Examples include the signal of a washing machine notifying the user that it has finished washing when unattended.</p>					

#### 5.4 Caution signals

ON/OFF patterns in accordance with table 3 shall be used for caution signals. Two or more signals may be used in a product if necessary.

Example A photocopier gives one signal for running out of paper and another signaling lack of toner.

The patterns are presented in an arbitrary order in table 3, and any signal may be chosen form a signal category, as appropriate.

A strong caution signal should repeat until the user intervenes.

**Table 3 ON/OFF patterns of caution signal**

Signal category	ON time s	OFF time s	Repetition	Onomatopoeic description	Patterns
Strong caution signal	0.1	0.1	Multiple repetition	Pi-pi-pi...(quick and consecutive)	
	0.1 to 0.3	0.05 to 0.15	Multiple repetition	Peep-peep-peep (consecutive)	
Weak caution signal	0.5	0.2 to 0.25	Multiple repetition	Peetz, peetz... (consecutive)	
	0.1	OFF1=0.05 OFF2=0.5	Multiple repetition	Pi-pip, pi-pip, ... (intermittent)	

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- [1] JIS C 0457 : 2006 *Preparation of instructions — Structuring, content and presentation*
- [2] JIS S 0014 *Guidelines for the elderly and people with disabilities — Auditory signals on consumer products — Sound pressure levels of signals for the elderly and in noisy conditions*
- [3] JIS Z 8071 *Guidelines for standards developers to address the needs of older persons and persons with disabilities*
- [4] ISO 7731 *Ergonomics — Danger signals for public and work areas — Auditory danger signals*
- [5] ISO 8201 *Acoustics — Audible emergency evacuation signal*
- [6] ISO 11429 *Ergonomics — System of auditory and visual danger and information signals*
- [7] ISO/TR 22411 : 2008 *Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities*
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**Annex JA (informative)**  
**Comparison table between JIS and corresponding International Standard**

<b>JIS S 0013 : 2011</b> <i>Guidelines for older persons and persons with disabilities — Auditory signals for consumer products</i>				<b>ISO 24500 : 2010</b> <i>Ergonomics—Accessible design—Auditory signals for consumer products</i>			
(I) Requirements in <b>JIS</b>		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between <b>JIS</b> and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
3 Terms and definitions	3.3.2 invalid input signal		3	Practically identical with <b>JIS</b> .	Addition	In <b>JIS</b> , the definition of the term “invalid input signal” is added. The term is also added to NOTE concerning the definition of operation confirmation signals, to state that it is included in the operation confirmation signals.	The signal is widely used in office automation equipment in Japan. A proposal concerning this matter will be submitted at the revision of the <b>ISO</b> .
5 Temporal patterns of auditory signals	5.2 Operation confirmation signals Table 1 ON/OFF patterns of operation confirmation signals		5	Practically identical with <b>JIS</b> .	Addition	ON/OFF patterns of invalid input signal are specified.	The signal is widely used in office automation equipment in Japan. A proposal concerning this matter will be submitted at the revision of the <b>ISO</b> .

Overall degree of correspondence between **JIS** and International Standard (**ISO 24500** : 2010) : MOD

NOTE 1 Symbols in sub-columns of classification by clause in the above table indicate as follows :

– Addition : Adds the specification item(s) or content(s) which are not included in International Standard.

NOTE 2 Symbol in column of overall degree of correspondence between **JIS** and International Standard in the above table indicates as follows :

– MOD : Modifies International Standard.



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